Protocol Information

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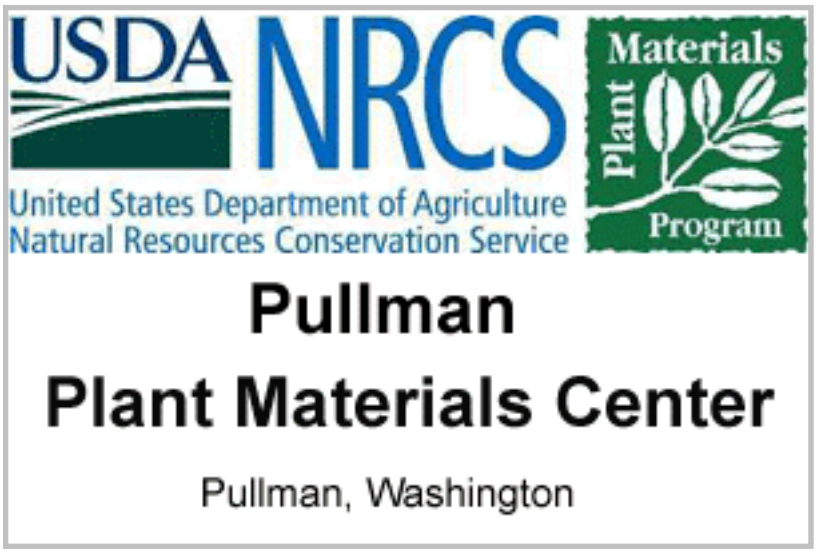

Family Scientific Name:	**Asteraceae**
Family Common Name:	**Sunflower**
Scientific Name:	***Microseris nutans*** **(Hook.) Schulz-Bip. ' '**
Common Synonym:	**' '**
Common Name:	**Nodding microseris**
Species Code:	**MINU**
Ecotype:	**Paradise Creek drainage near Pullman, Washington.**
General Distribution:	**British Columbia and northwestern US east to Montana and South Dakota and south to Colorado and California. Mean annual precipitation range is from 16-60 inches (USDA NRCS 2006). In eastern Washington it is usually found in mesic open grassland and open Ponderosa pine forest.**
Known Invasiveness:	
Propagation Goal:	**Plants**
Propagation Method:	**Seed**

Product Type:	**Container (plug)**
Stock Type:	
Time To Grow:	**14 Months**
Target Specifications:	**Tight root plug in container.**
Propagule Collection:	**Fruit is an achene which ripens in June. It is collected when the pappus begins to expand. Seed is brown in color and wind disseminated, so must be collected before it blows away. Seed maturity is indeterminant and daily collections are needed to maximize volume. Seed is stored in paper bags at room temperature until cleaned. Seed should be stored loosely in bags. Compressing the seed with the attached pappus increases difficulty during cleaning.** **We determined 215,692 seeds/lb for this ecotype.**
Propagule Processing:	**Seed is rubbed lightly, then passed thru a hand screen and rubbed again to separate the pappus, then cleaned with an air column separator. Clean seed is stored in controlled conditions at 40 degrees Fahrenheit and 40% relative humidity.**

Pre-Planting Treatments: **Some germination occurs without pretreatment, but 90 or more days of cool, moist stratification maximizes germination. Seed can germinate in cool temperatures.**
Unpublished data from trials conducted at the Pullman Plant Materials Center revealed that 22.5% germination occurred without stratification. 45 days of cold, moist stratification resulted in 55% germination. 90 days of cold, moist stratification resulted in 75% germination. 92.5% germination was obtained from seeds sown in containers in early November and left outside under cool, fluctuating spring temperatures. Seedlings which germinated in the greenhouse thrived in the constant warmth, so it is likely the longer stratification time and not the cool, fluctuating temperature was the factor in the increased germination. Germination in containers remaining outside began 10 days later than that in containers moved to the greenhouse after 90 days stratification.
***M. troximoides* (*Nothocalais troximoides*) does not germinate without pretreatment (Maguire & Overland, 1959).**

Growing Area Preparation/ Annual Practices for Perennial Crops:	**In early November seed is sown in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. A thin layer of pea gravel is applied to prevent seeds from floating. Conetainers are watered deeply and placed outside. Alternately, seed can be moist stratified in a refrigerator for 90+ days before sowing in the greenhouse.**
Establishment Phase:	**Containers are moved to the greenhouse in early February. Germination usually begins in 3 days and is complete in 10 days, although a few seeds may germinate 2-3 weeks later.**
Length of Establishment Phase:	**10-14 days**
Active Growth Phase:	**Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients. Plants are moved to the cold frame in late March or early April, depending on weather conditions, then moved to the lath house in June. Plants will not attain tight root plugs by early May and are held in the lath house until the following spring. They are watered every other day if the weather is cool, and every day during hot, dry spells. Plants make little further growth after June, and may senesce in late summer. Senescent plants are given only enough water to prevent the medium from drying completely. Starting stratification earlier**

	possibly will result in field ready plants by the first planting season.
Length of Active Growth Phase:	
Hardening Phase:	**Since the plants are grown outside, additional hardening is not needed.**
Length of Hardening Phase:	
Harvesting, Storage and Shipping:	**Plants are stored in the lath house over winter. They should be afforded some protection from extreme cold temperatures. Mulch or foam sheets provide sufficient protection. The protection should be removed in late winter or early spring as temperatures begin to rise. Regrowth will begin in early March as soon as temperatures begin to warm and plants will be field ready in late April.**
Length of Storage:	
Outplanting performance on typical sites:	**Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site. Survival in seed increase plantings without competing vegetation averages 90%. Transplanting into sites with existing vegetation may reduce survival and vigor depending on weather conditions following planting. Most plants will flower and produce seed the season following outplanting. Plants will go dormant during the warm parts of the summer.**
Other Comments:	**No insect or disease problems have been noted.**

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Citation:

Skinner, David M. 2006. Propagation protocol for production of container *Microseris nutans* (Hook.)Schulz-Bip. ' ' plants ( ); Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 7 February 2006). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.